(REPORT OF) PERCOLATION ABILITY OF FISHER CREEK AND OTHER HYDROLOGICAL DATA OF THE COYOTE VALLEY

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REPORT ON PERCOLATION ABILITY OF FISHER CREEK AND OTHER HYDROLOGICAL DATA OF THE COYOTE VALLEY

to

J. Robert Roll, Chief Engineer & Manager
Santa Clara Valley Water Conservation District

by

John H. Clarke
Associate Civil Engineer

November 12, 1958

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SANTA CLARA VALLEY WATER CONSERVATION DISTRICT

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November 12, 1958

Mr. J. Robert Roll
Chief Engineer and Manager
Santa Clara Valley Water Conservation District
15420 Almaden Road
San Jose, California

Dear Mr. Roll:

In December, 1957 you requested that I conduct a percolation study of Fisher Creek located in the Coyote Valley.

Submitted herewith is the Report on Percolation Ability of Fisher Creek and other Hydrological Data of the Coyote Valley.

Respectfully submitted,

John H. Clarke,
Associate Civil Engineer

JHC:pt
Encl-

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SYNOPSIS

The farmers in the area of Fisher Creek, located on the west side of the Coyote Valley have for some time felt that if surface water were conducted from Coyote River to Fisher Creek the water would percolate into natural aquifers and thereby replenish the wells on this west side directly. The results of this report show that percolation of water from the natural channel of Fisher Creek into the underground reservoir is not possible. Percolation in Coyote River has satisfactorily taken care of the replenishment of many of the wells of the Coyote Valley. Studies made from well yield measurements indicate that limited benefits from Coyote River percolation are received by well users in the Fisher Creek area. The District has adopted a policy that in areas not adequately served by percolation, it will construct a main line to supply water for direct surface irrigation if the potential water users will construct the necessary laterals, and assume any pumping costs.

DESCRIPTION OF THE AREA

The Coyote Valley is that portion of the Santa Clara Valley bounded on the north by a convergence of the mountains that rim the valley, known as the "Lower Gorge", in the vicinity of the town of Coyote, and bounded on the south by the delta cone located immediately west of Leroy Anderson Dam. Just east of the centerline of the Coyote Valley, the Coyote River flows in a meandering manner the full length of the valley. As can be noted on Plate I, Fisher Creek originates at a point just south of the town of Madrone, adjacent to the Southern Pacific Railroad tracks. Fisher Creek exists in the form of a drainage ditch and winds its way along the west side of the valley and joins Coyote River just north of the town of Coyote.

Prior to 1918, there existed a large "lake" bounded on the east by the Southern Pacific Railroad tracks, on the north and west by the surrounding foothills, while the upper end of the lake was located between Laguna and Richmond Avenues. The old Laguna Seca Rancho and Laguna Avenue were named after the lake. Since the water in the lake wouldn't seep through the heavy clay layers into the underlying gravel strata, a reclamation district, known as Laguna Seca Reclamation District, was formed by the farmers of the area. The Reclamation District deepened Fisher Creek and drained the lake into Coyote River.

TESTS UNDERTAKEN

Percolation, as used in this report, is the passage of water through gravel and other porous strata into the underground reservoir.

In order to determine the likelihood of percolation in Fisher Creek streamflow measurements were made at points along the creek and at its tributaries. Since it is a known fact that percolation does not exist in the old Laguna Seca lake area, streamflow measurements were not made north of Palm Avenue.

During last Winter and Spring, six different sets of streamflow measurements were made while storm run-off was producing streamflow in Fisher Creek.

RESULTS OF TESTS

Table I shows the results of the streamflow measurements made.

The most accurate results can be obtained when the stream flow is at steady flow or stage. If the stream is either rising or falling, the channel itself is either taking on storage or releasing storage, respectively, and thereby yielding distorted percolation results. Therefore, five measurements were made at steady stage while one was made during a falling stage with distorted results. In Table I, only the five measurements from February 10 to April 12 yielding accurate results will be considered.

The results show that an average of 1.4 cubic feet per second is lost in the channel to percolation. As will be shown later in this report the 1.4 c.f.s. is only absorbed into the surrounding top soil.

GEOLOGY OF THE VALLEY FLOOR

Underlying the farm lands of the Coyote Valley are irregular bodies of gravel, sand, silt and clay deposited by the wandering courses of Coyote River and various streams draining the surrounding water sheds of the mountains during earlier geological times. During this process of deposition Coyote River and other streams have meandered many times back and forth from east to west generally flowing in a northerly direction. Since the valley was built up to the present level, the underlying porous gravels have offered storage or channel space for underground water, and it is from this underground water body that the well supply for irrigation and domestic use is drawn. This underground water supply should be considered partly as a vast reservoir and partly as a very slowly and irregularly moving body of water generally flowing northward through the "Lower Gorge" into the main underground reservoir of the Santa Clara Valley.

PROXIMITY OF FISHER CREEK TO UNDERLYING GRAVEL STRATA

Drillers logs of over 125 wells were obtained to determine the proximity of the underlying gravel strata to the channel of Fisher Creek. On Plate I locations of the wells used in this study are plotted. From the well logs and their locations, contours were drawn connecting points of equal depth to gravel.

It can be noted that at no point along Fisher Creek is the upper gravel strata closer to the surface of the ground than about 9 feet.

The Fisher Creek channel ranges in depth from 2 feet at the southernmost crossing of Orchard Avenue (also known as Church Ave.) to about 6 feet at Bailey Avenue crossing.

Therefore, since Fisher Creek channel does not have any physical contact with the underlying gravel strata the small average losses of 1.4 cubic feet per second obtained during the percolation tests can only be attributed to absorption into the surrounding top soil.

REPLENISHMENT OF COYOTE VALLEY WELLS

Located in the Coyote watershed are two large dams constructed by the District, namely, Leroy Anderson and Coyote Dams. These dams have a total capacity of 100,000 acre-feet and were constructed for the purpose of impounding waste waters and later releasing them for subsequent direct usage and percolation into the underground reservoir.

To aid natural percolation along Coyote River in Coyote Valley, the District has constructed four temporary gravel spreading dams. One is located just upstream from Burnett Road bridge; another about 1 1/2 miles downstream; while two more are located about 2 miles further downstream on the old P.C.A. gravel plant property.

Plate 2 shows, graphically, the fluctuation of the average depth to water level of the underground reservoir in Coyote Valley from 1935 to the present time. It can be noted that in May 1958, the average level reached the highest point since 1945.

WELL YIELD STUDY

In order to determine the benefits received from the percolation of Coyote River water data was collected from pump tests made by the Pacific Gas & Electric Company. Locations of the measured wells and their yields in gallons-per min-per-foot-of-drawdown were plotted on Plate 3. From this information, contours were drawn connecting points of equal well yield.

The results of the study indicate that all of the area adjacent to Fisher Creek south of Bailey Avenue has poor well yields. The average yield is about one gallon-per-minute-per-foot-of-drawdown. Therefore, this area receives very little benefit from percolation in Coyote River.

RECOMMENDATION

In the Evergreen Area, known as Improvement District No.1 a region adjacent to the eastern foothills of Santa Clara Valley received very little benefit from the District's percolation.

To improve this situation, the District's Board of Directors passed Resolution No. 460 on August 6, 1957 outlining that if the taxpayers of this region are willing to set up an improvement district to assess themselves for the cost of an additional pump, the operation of the pump, and a distribution system of lateral pipe lines the Santa Clara Valley Water Conservation District would assume the costs of the main pipe line to the system. It further states that if other similar areas in the District exist, the District is willing to take like action.

The water problems of the Fisher Creek area can be solved in a similar manner. If the landowners in the area of low well yields and poor percolation are willing to provide the necessary pumps (if any) and lateral lines the District has expressed itself as willing to construct the main line.

This is the only way in which this area can receive additional benefits.

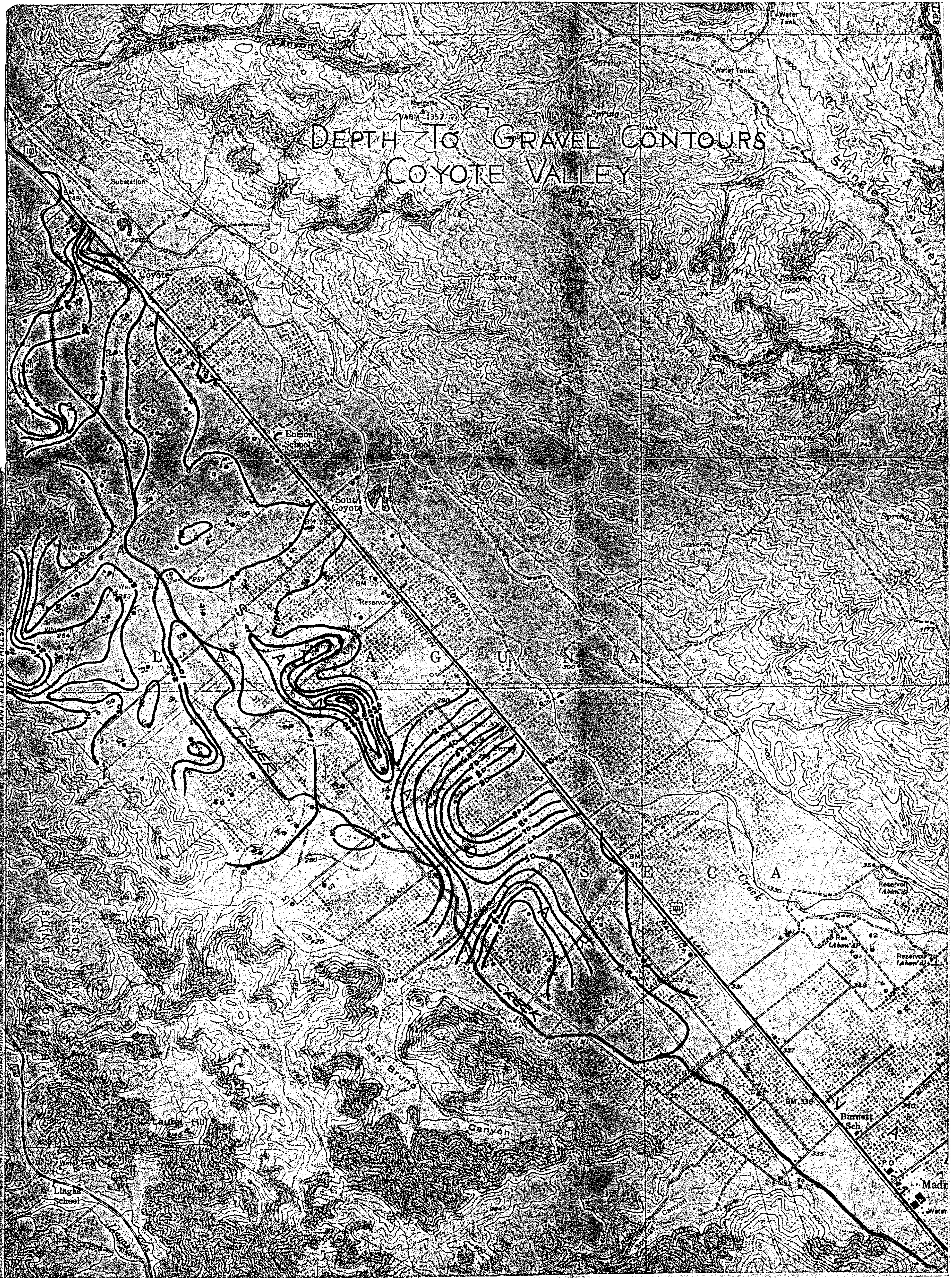
PERCOLATION · CHECK — FISHER CREEK

LOCATION	FEB 3, 1958		FEB 10, 1958		FEB 27, 1958		MARCH 7, 1958		MARCH 18, 1958		APRIL 12, 1958	
	FLOW (C.F.S.)	PERCOLATION (C.F.S.)	FLOW (C.F.S.)	PERCOLATION (C.F.S.)	FLOW (C.F.S.)	PERCOLATION (C.F.S.)	FLOW (C.F.S.)	PERCOLATION (C.F.S.)	FLOW (C.F.S.)	PERCOLATION (C.F.S.)	FLOW (C.F.S.)	PERCOLATION (C.F.S.)
FISHER CREEK AT WILLOW SPRINGS ROAD	8.3		0.9		1.0		0.3		1.1		1.2	
INFLOW FROM DRAINAGE DITCHES	5.3	0.9	NONE	0.9	0.1	0.6	NONE	0.3	0.04	1.1	NONE	1.7
INFLOW FROM SAN BRUNO CREEK	4.1		NONE		1.2		NONE		0.8		2.2	
FISHER CREEK — SAN BRUNO AVE.	16.8		NONE		1.7		NONE		0.9		1.7	
INFLOW FROM DRAINAGE DITCHES	2.7	3.2	NONE	NONE	NONE	0.5	NONE	NONE	NONE	0.7	NONE	1.4
FISHER CREEK JUST ABOVE PALM AVE.	16.3		NONE		1.2				0.2		0.3	
TOTAL PERCOLATION		4.1		0.9		1.1		0.3		1.8		3.1
FLOW REMARKS	FALLING STAGE		STEADY STAGE		STEADY STAGE		STEADY STAGE		STEADY STAGE		STEADY STAGE	

Table 1

FLUCTUATION OF AVERAGE WATER LEVEL
COYOTE VALLEY AREA
SANTA CLARA VALLEY WATER CONSERVATION DISTRICT

Plate #2


DEPTH TO GRAVEL CONTOURS
COYOTE VALLEY
Metcalf Canyon
Water Tank
ROAD
Spring
Water Tanks
Metcalf
VABM 1357
Shingle Valley
101
Substation
BM 245
Coyote
Spring
Encinal School
BM 252
South Coyote
BM 256
Water Tank
BAILEY
Well
257
BM 291
Reservoir
SOUTHERN
Coyote
L A G U N A
S E C A
FISHER
CREEK
300
BM 300
320
BM 311
Creek
Reservoir (Aban'd)
3 Res. (Aban'd)
Reservoir (Aban'd)
Gravel Pit
Springs
Spring
SANTA TERESA HILLS
205
10
240 000 FEET
San Bruno Canyon
Laurel Hill
Llagas School
Water Tank
BM 336
Burnett Sch
335
337
Madr

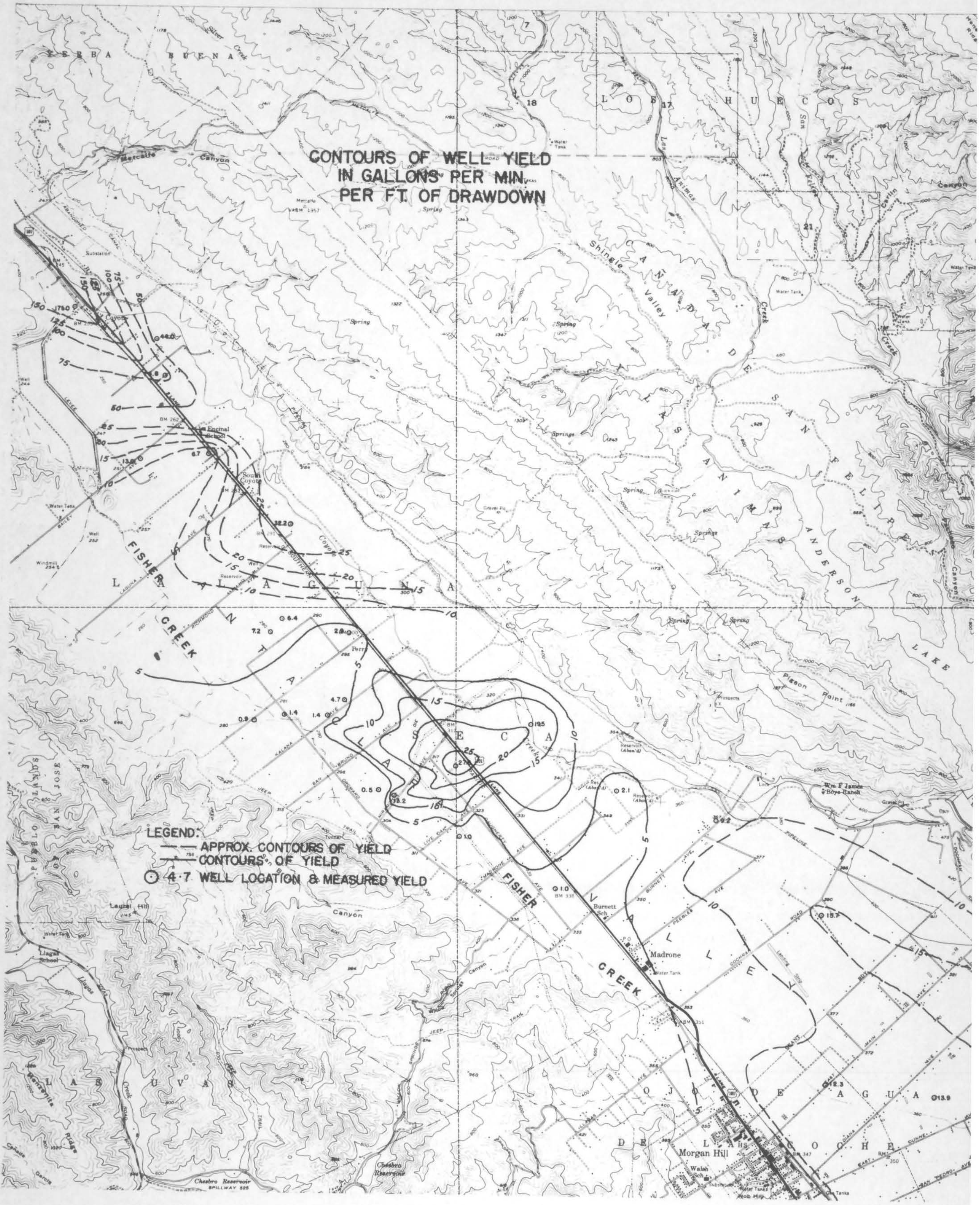

CONTOURS OF WELL YIELD
IN GALLONS PER MIN.
PER FT. OF DRAWDOWN
LEGEND:
APPROX. CONTOURS OF YIELD
CONTOURS OF YIELD
⊙ 4.7 WELL LOCATION & MEASURED YIELD
YERBA BUENA
LOS HUECOS
CAÑADA DE SAN FELIPE Y LAS ANIMAS
SANTA CLARA
LAGUNA SECA
FISHER CREEK
LLAGAS VALLEY
OJO DE AGUA DE LA COCHE
LAS UVAS
PUEBLO LANDS OF SAN JOSE
Metcalfe Canyon
Shingle Valley
Anderson Lake
Pigeon Point
Coyote
South Coyote
Encinal School
Perry
Burnett Sch.
Madrone
Morgan Hill
Walsh Sch.
Llagas School
Chesbro Reservoir
Wm F James Boys Ranch
175.0
44.0
13.6
8.7
32.2
6.4
7.2
2.8
4.7
1.4
1.4
0.9
0.5
19.5
27
13.2
1.0
2.1
9.2
1.0
15.7
12.3
13.9

Plate 3